Name: Date:

Polynomial Factoring solution (version 627)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 34 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(34)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 136}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-72}}{2}$$

$$x = \frac{8 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{8 \pm 6\sqrt{2}\, i}{2}$$

$$x = 4 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-3 - 2i$ and $-4 - 7i$ in standard form $(a + bi)$.**

Solution

$$(-3 - 2i) \cdot (-4 - 7i)$$

$$12 + 21i + 8i + 14i^2$$

$$12 + 21i + 8i - 14$$

$$12 - 14 + 21i + 8i$$

$$-2 + 29i$$

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3. **Write function $f(x) = x^3 + 5x^2 - 2x - 24$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	5	-2	-24
-4		-4	-4	24
	1	1	-6	0

$$f(x) = (x+4)(x^2+x-6)$$

$$f(x) = (x+4)(x+3)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-1) \cdot (x-4)^2 \cdot (x-7)$$

Sketch a graph of polynomial $y = p(x)$.